DOCUMENT RESUME

ED 278 886 CG 019 664

AUTHOR Neale, Anne Victoria; And Others
TITLE Cardiovascular Risk Factors and Behavioral Contracting in Exercise Programs.
PUB DATE Aug 86
NOTE 14p.; Paper presented at the Annual Meeting of the American Psychological Association (94th, Washington, DC, August 22-26, 1986).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adults; Aerobics; Behavior Change; Cardiovascular System; *Compliance (Psychology); *Exercise; High Risk Persons; *Obesity; *Performance Contracts; *Physical Fitness; *Smoking
IDENTIFIERS *Health Promotion

ABSTRACT

The use of behavioral contracting in exercise programs has been shown to be effective in increasing the frequency of exercise activity and in reducing dropout rates. A study was undertaken to examine the impact of three cardiovascular risk factors (poor physical fitness, obesity, and smoking) on both client willingness to sign a behavioral contract to adopt an aerobic exercise program and on the outcome of such contract signing. Of 179 individuals asked to sign the exercise contract, 96 did so; 21.9% partially met the contract goal of at least three 20-minute aerobic sessions per week, 42.7% fully met their goal, and 35.4% did not meet the exercise goal. Smoking and weight risk were related to contract signing, but level of physical fitness was not. Body weight was the only risk factor related to contract success. Health locus of control subscales were not related to either contract signing or adherence, and attitudes toward exercise were only weakly related. The findings support the conclusions that overweight people are less likely to sign an exercise contract, and those who do sign such contracts are less likely to adhere to contract requirements; and that smokers are less likely to sign exercise contracts, but those who do are as successful as nonsmokers. Behavioral contracting appears to be a useful technique for facilitating adherence to exercise programs. (NB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED278886

CARDIOVASCULAR RISK FACTORS AND BEHAVIORAL CONTRACTING IN EXERCISE PROGRAMS

A.V. Neale, R.O. Scott, S.S. Singleton, J.W. Hess & M.A. Hwalek

Department of Family Medicine
Wayne State University, Detroit, Michigan

Paper presented at the 94th Annual Meeting of the American Psychological Association, Washington, D.C., August, 1986.

CG 019664

ABSTRACT

The use of behavioral contracting in exercise programs has been shown to be effective in increasing the frequency of exercise activity, and in reducing drop-out rates. This paper examines the impact of three cardiovascular risk factors (poor physical fitness, obesity, and smoking) on both client willingness to sign a behavioral contract to adopt an aerobic exercise program, and also the outcome of such contract signing. Of 179 people asked to sign the exercise contract, 96 did so; 21.9% partially met the contract goal of at least three 20 minute aerobic sessions per week, 42.7% fully met their goal, and 35.4% did not meet the exercise goal. Smoking and weight risk were related to contract signing, but level of physical fitness was not. Body weight was the only risk factor related to contract success. Health locus of control subscales were not related to either contract signing or adherence, and attitudes toward exercise were only weakly related.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Anne Victoria Neale

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CARDIOVASCULAR RISK FACTORS AND BEHAVIORAL CONTRACTING IN EXERCISE PROGRAMS

Behavioral contracting is an effective method for increasing adherence to a diversity of health behavior prescriptions (Swain, 1981, Winett, 1973, Mann, 1972, Jeffrey, 1978, Epstein, 1980). While the use of behavioral contracting has not been widely reported in exercise programs, it has been shown to be effective in increasing activity frequency and reducing drop-out rates (Epstein, 1980, Wysocki, 1979, Oldridge, 1981).

The presence of heart disease risk factors seems to be inversely related to the adoption and maintenance of a regular exercise program. A few studies (Massie, 1971, Andrew, 1979, Dishman, 1980) have reported that overweight people are less likely to adhere to an exercise regimen. In addition, several investigations have reported that smokers were less successful than non-smokers in initiating and sustaining exercise routines (Bruce, 1976; Oldridge, 1979, Massie, 1971, Kavanagh, 1980).

This paper examines both the willingness to sign an exercise behavioral contract, and the outcome of such contract signing, among individuals with three different cardiovascular risk factors. The data reported here are drawn from a health promotion program in which behavioral contracting was employed to increase adherence to intervention strategies designed to reduce the risk of cardiovascular disease.

This paper will address two research questions:

1. Is cardiovascular risk factor status (i.e., smoking, obesity, and poor physical fitness) related to willingness to sign a

behavioral contract to increase aerobic exercise activity?

2. What variables relate to success in meeting fitness objectives among contract signers? The independent variables of interest were the type of cardiovascular risk factor, attitudes towards exercise, and health locus of control.

METHODS

The study cohort were 223 people enrolled in a health promotion program conducted by the Department of Family Medicine at the Wayne State University (WSU) School of Medicine in Detroit, Michigan. Most of these individuals were patients at the WSU Family Practice Center, and a small number were employees of the health care facility in which the clinic is housed.

The health promotion program involved screening and intervention for five cardiovascular risk factors: hypertension, dislipidemia, smoking, obesity, and poor physical fitness. Baseline clinical data and information on health-related behaviors and attitudes were collected from July 1983 through February 1984. A second assessment was conducted six months later. As a condition of program participation, subjects were asked to sign a statement in which they agreed to make behavior changes designed to lower their elevated risk factor levels (if they were subsequently found to have any).

After the initial assessment, all subjects received a written report of their clinical results and educational material which offered specific guidelines for lowering each of the cardiovascular risk factors which were defined as being in the range of medium or high risk. In addition, all subjects were asked to make

an appointment with the health counselor to design an individualized health risk reduction program.

During the initial health education appointment, regardless of baseline fitness status, (which was measured with a treadmill stress test) all subjects were asked to sign a behavioral contract to either achieve or maintain their current aerobic exercise program. Typically, the contract committed the individual to a minimum of three twenty-minute aerobic workouts a week, for a twelve week period. Contractors were given an exercise diary supplied by the Chicago Heart Association, and were told they would receive one point for each exercise session, and that they would be obliged to collect thirty of thirty-six possible points over the twelve week contracting period in order to earn a prize of either a T-shirt with a "Go-4-Health" logo or a medical self-help book.

All clients who signed an exercise contract were counseled on the physical and psychological benefits of exercise, and techniques to enhance exercise motivation. In order to increase adherence and help reinforce positive attitudes toward exercise, the contract signers were offered free exercise classes twice a week.

At the end of each contract period, clients were scheduled for an assessment appointment during which their level of adherence to contract obligations was determined. Individuals who failed to meet their goal were asked to sign another contract. Successful clients were given a prize and encouraged to continue regular exercise.

For purposes of data analysis, contract signers were assigned to one of three adherence categories: non-adherence; partial adherence; and full-adherence.

RESULTS

Of the 223 people in the program, only 179 kept their appointments to see the health counselor. Most of these people (n = 144) were in the medium or high risk categories for poor aerobic fitness (as measured by a treadmill stress test). All 179 people were asked to sign an exercise contract, and 96 did so. Among these 96 contract signers, 34 failed to initiate meaningful changes in exercise habits, 21 achieved partial fulfillment of the 20 minutes/day, 3 days/week goal, and 41 fully met this goal.

Risk Factors, Contract Signing, and Contract Success

Table 1 shows the demographic and risk factor predictors of contract signing. Table 2 shows how these same variables related to contract adherence.

Fitness level at baseline was not related to contract signing, or contract success.

Body weight risk level was related to both contract-signing ($p < 0.01$), and contract adherence ($p < 0.05$).

Smoking related to contract signing ($p < 0.01$), but not contract adherence.

Health Locus of Control

At the initial assessment all subjects were asked to respond to the MCLC health locus of control internal and powerful others

subscales (Wallston et al., 1978) and also to 12 items measuring attitudes about exercise. Table 3 shows that neither of the health locus of control subscales were related to either contract signing or contract success.

Attitudes Toward Exercise

Among 12 items measuring attitudes toward exercise, three were related to contract signing. They were: "It is hard for me to stick to a regular schedule of physical activity" ($p < 0.01$); "I usually drive or ride short distances rather than walk" ($p < 0.057$); and "When I exercise or play sports, I feel self-conscious about the way I look to others" ($p < 0.059$).

Only one exercise attitude item related to contract adherence: "It is hard for me to find the time to exercise on a regular basis" ($p < 0.065$).

DISCUSSION

Of the 96 subjects who signed exercise contracts, 55 reported improvements in their exercise habits either partial or full contract adherence). Many clients expressed a feeling that their active role in negotiating realistic and measureable exercise goals facilitated improved exercise habits. Of the three cardiovascular risk factors, only smoking and weight risk level were related to exercise contract signing, but only degree of obesity predicted contract adherence. Three attitude items also predicted contract success, and these may have tapped a dimension of "perceived barriers" to success. This construct may be useful

in understanding whether or not individuals maintain a regular exercise schedule.

Since program participants weren't randomly assigned into a contracting or no-contracting group, the data do not permit a rigorous evaluation of the effects of contracting on program compliance. However, the data do provide information on variables which relate to contract signing and success among individuals who are motivated or not so motivated to sign such a contract.

In summary, the data support the following conclusions: Overweight people are less likely to sign an exercise contract, and those who do sign such contracts are less likely to adhere to the contract requirements; Smokers are less likely to sign exercise contracts, but those who do are as successful as non-smokers; The health locus of control internal and powerful others subscales were not related to either contract signing or contract adherence; Attitudes toward exercise are only weakly predictive of contract signing; Behavioral contracting appears to be a useful technique for facilitating adherence to exercise programs.

TABLE 1

PREDICTORS OF EXERCISE COUNSELING AND CONTRACT STATUS

(N = 221)

VARIABLE	NO COUNSELING NO CONTRACT (N=42)	COUNSELING NO CONTRACT (N=83)	COUNSELING CONTRACT (N=96)	STATISTICS	p-VALUE
Mean Age	37.69	40.25	39.44	F = 1.12	0.33
Mean Education+	4.55	4.52	5.04	F = 3.65	0.03
Non-Smokers	15%	34%	51%	χ^2 = 10.45	0.005
Smokers	26%	45%	29%		
Weight: Low Risk	20%	32%	48%	χ^2 = 13.04	0.01
Medium Risk	12%	33%	56%		
High Risk	21%	54%	25%		
Fitness: Low Risk	24%	41%	35%	χ^2 = 2.05	0.73
Medium Risk	18%	37%	46%		
High Risk	20%	33%	47%		
Race: Black	22%	37%	41%	χ^2 = 3.19	0.20
White	12%	36%	52%		
Sex: Male	23%	38%	39%	χ^2 = 1.39	0.50
Female	17%	37%	46%		

+Values were determined using Hollinghead's Scale of Education: 4 = High School
5 = Partial College

TABLE 2

PREDICTORS OF EXERCISE CONTRACT ADHERENCE

(N = 96)

VARIABLE		NO CONTRACT ADHERENCE (N = 34)	PARTIAL CONTRACT ADHERENCE (N = 21)	FULL CONTRACT ADHERENCE (N = 41)	STATISTIC	p VALUE
Non-Smokers		34%	24%	42%	X^2 = 1.179	0.55
Smokers		41%	14%	45%		
Weight Risk*	Low	36%	14%	50%	X^2 = 10.318	0.04
	Med	33%	25%	42%		
	High	36%	50%	14%		
Fitness Risk*	Low	44%	6%	50%	X^2 = 8.853	0.06*
	Med	34%	22%	41%		
	High	0%	57%	43%		
Race:						
Black		41%	20%	39%	X^2 = 2.800	0.25
White		23%	27%	50%		
Sex:						
Male		38%	21%	41%	X^2 = 0.118	0.94
Female		34%	22%	43%		
Mean Age		38.44	38.81	40.59	F = 0.59	0.56
Mean Education**		5.18	4.86	5.02	F = 0.35	0.71

*Contained expected cell counts less than 5.

**Values were determined using Hollingshead's Scale of Education:
4 = High School and 5 = Partial College.

TABLE 3

RELATIONSHIP OF THE MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL SUBSCALES AND EXERCISE CONTRACTING

Internal Locus of Control	N	MEAN	F	P
Contract Signing:			3.75	0.05
Non-Signers	123	26.20		
Signers	95	25.06		
Contract Adherence:			1.73	0.18
Non-Adherence	34	24.15		
Partial Adherence	21	25.24		
Full Adherence	40	25.75		
Powerful Others Locus of Control				
Contract Signing:			3.21	0.07
Non-Signers	124	20.84		
Signers	96	19.59		
Contract Adherence:			0.16	0.85
Non-Adherence	34	19.38		
Partial Adherence	21	19.28		
Full Adherence	41	19.93		

REFERENCES

Andrew, G.M., Parker, J.O.
Factors Related to Dropout of Post Myocardial Infarction Patients from Exercise Programs. Med. Sci. Sports, 1979, 11, 376-378.

Bruce, E.H., Fredrick, R., Bruce, R.A., Fisher, L.D.
Comparison of Active Participants and Drop-Outs in CAPRI Cardiopulmonary Rehabilitation Programs. Am. J. Cardiology, 1976, 37, 53-60.

Dishman, R.K., Ickes, W. and Morgan, W.P.
Self-Motivation and Adherence to Habitual Physical Activity. J. Appl. Social Psych. 1980, 10, 115-132.

Epstein, L.H., Wing, R.R., Thompson, J.K., and Griffin, W.
Attendance and Fitness in Aerobics Exercise: The Effects of Contract and Lottery Procedures. Beh. Mod., 1980, 4, 465-479.

Jeffrey, R.W., Thompson, P.D., Wing, R.R.
Effects on Weight Reduction of Strong Monetary Contract for Caloric Restriction on Weight Loss. Beh. Res. Ther., 1978, 16, 363-369.

Kavanaugh, T., Shephard, R.J., Chisholme, H.W., Querershi, S., and Kennedy, J. Prognostic Indexes for Patients with Ischemic Heart Disease Enrolled in an Exercise Centered Rehabilitation Program. Am. J. Cardiology, 1980, 44, 1230-1240.

Mann, R.

The Behavior-Therapeutic Use of Contingency Contracting to Control an Adult Behavior Problem: Weight Control. J. Appl. Beh. Anal. 1972. 5, 99-109.

Massie, J.F. and Shephard, R.J.

Physiological and Psychological Effects of Training: A Comparison of Individual and Gymnasium Programs. Med. Sci. Sports, 1971, 3, 110-117.

Oldridge, N.B.

Compliance of Post-Myocardial Infarction Patients to Exercise Programs. Med. Science Sports, 1977, 11, 373-375.

Oldridge, N.B., Jones, N.L.

Contracting as a Strategy to Reduce Drop-Out in Exercise Rehabilitation. Med. Sci. in Sports and Exercise, 1981, 13, 125-126.

Swain, M.A., Steckel, S.

Influencing Adherence Among Hypertensives. Res. Nurs. Health, 1981, 4, 213-222.

Wallston, K.A., Wallston, B.S. & DeVellis, R.

Development of the Multidimensional health locus of control (MHLC) Scales. Health Education Monographs, 1978, 6, 160-171.

Winett, R.A.

Parameters of Deposit Contracts in the Modification of Smoking. Psych. Record, 1973, 23, 49-60.

Wysocki, T., Hall, G., Awata, B., Riodon, M.

Behavioral Management of Exercise: Contracting for Aerobic Points. J. Appl. Analysis, 1979, 12, 55-64.